2 Sheets--Sheet 1.

J. P. SMITH & S. W. RICKER.

Sewing-Machine for Stitching Straw.

No. 164,047. Patented June 1, 1875.

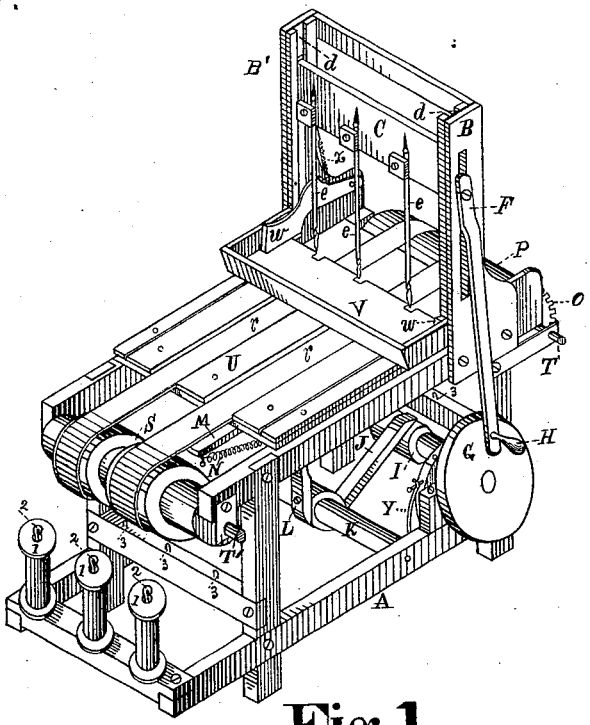

Fig. 1.

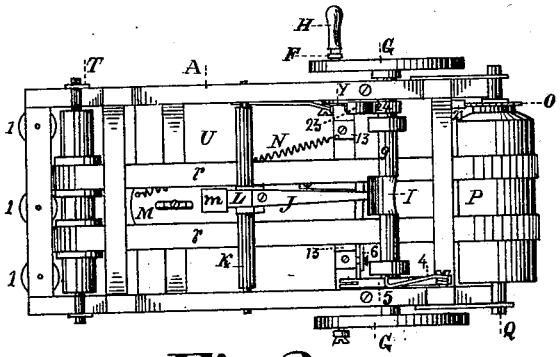

Fig. 2.

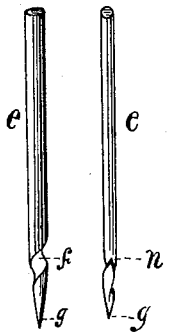

Fig. 3.

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2 Sheets--Sheet 2.

J. P. SMITH & S. W. RICKER.

Sewing-Machine for Stitching Straw.

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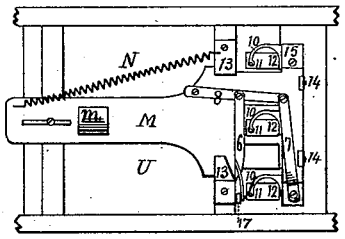

Fig.4.

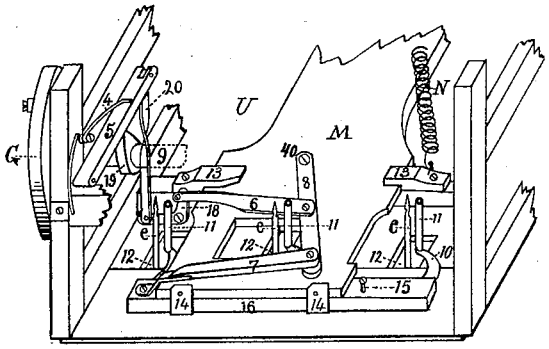

Fig.5.

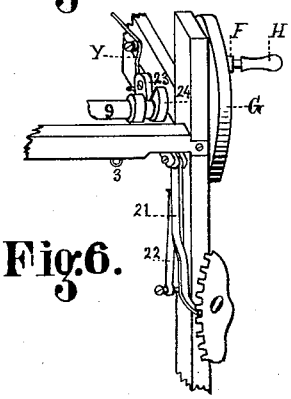

Fig.6.

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THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

UNITED STATES PATENT OFFICE.

JOHN P. SMITH AND SAMUEL W. RICKER, OF EXETER, NEW HAMPSHIRE.

IMPROVEMENT IN SEWING-MACHINES FOR STITCHING STRAW.

Specification forming part of Letters Patent No. **164,047**, dated June 1, 1875; application filed February 20, 1875.

To all whom it may concern:

Be it known that we, JOHN P. SMITH and SAMUEL W. RICKER, of Exeter, in the county of Rockingham, State of New Hampshire, have invented a certain new and useful Improvement in Sewing-Machines, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which our invention appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is an isometrical view; Fig. 2, a plan or bottom view; Fig. 3, a view of the needle; Fig. 4, a view of the thread-controlling mechanism; Fig. 5, a sectional isometrical view of the under part of the machine; and Fig. 6, a sectional view, showing the feed mechanism.

Like letters of reference indicate corresponding parts in the different figures of the drawing.

Our invention relates more especially to that class of sewing-machines which are designed for straw-work; and consists in a novel construction and arrangement of the parts, as hereinafter more fully set forth and claimed, by which a simpler, cheaper, and more effective device of this character is produced than is now in ordinary use.

In the drawing, A is the main frame of the machine, which is provided with the uprights B B′, having the runlets *d d*, in which the bar C slides. Secured to this bar by clamps and screws there are three needles, *e e e*, working vertically through notches in the edge of the gage-plate *v*, and to each end of the bar a pitman, F, is jointed, connecting it with the balance-wheels G G. Journaled at T, in one end of the frame A, there is a cylinder or drum, P, provided with a spur-wheel, O, in connection with which a spring, 22, and pawl 21 work to form an ordinary ratchet mechanism, the pawl being actuated by the pivoted lever Y in contact with the cam 24 on the main shaft 9. A corresponding drum, provided with bosses S, is journaled at T′ in the opposite end of the frame, and around these drums there are two continuous belts, *r r*, arranged to work in grooves in the bed-piece U in such a manner as to be flush therewith when in use. These belts are designed to be provided with a series of outwardly-projecting spurs or points (not shown) in the usual manner for feeding the work through the machine. A rocker-shaft, K, is centrally journaled in the frame beneath the bed U, and is provided with two arms or levers, L J, the free end of the arm J resting upon a cam or eccentric, I, on the shaft 9 of the balance-wheel G. A longitudinally-sliding bar, M, provided with the downwardly-projecting stud *m*, is fitted to work in ways 13 on the under side of the bed U, being constantly drawn in the direction of the drum P by the contractile action of the coiled spring N, one end of which is attached to the bar and the other to the frame-work of the machine. Pivoted to the bar M at 40 there is a horizontally-arranged lever, 8, and jointed to this lever are two others, 6 and 7, the lever 7 being connected at one end with the auxiliary slide 16, working in the ways 14, and the lever 6 with the pivoted bell-crank lever 18, which, in its turn, is connected with the pitman 20, the pitman being jointed to the horizontal lever 5, which is kept in contact with a cam, 19, on the shaft 9 by means of the spring 4. Projecting from the side of the slide, 16 nearest the needles *e* are three curved arms, 10, each of these arms being provided with a vertically-arranged tube or thread-carrier, 11. These thread-carriers are disposed in such a manner as to be contiguous to the needles, but not in actual contact therewith, and extend below the bed-plate of the machine nearly as far as the shoulder *n* of the needles when the same are at the end of their downward stroke. Pivoted to each side of the machine, and near the uprights B, extending under the bar C, there is a knife, *w*. These knives form the upper blades of two pairs of shears, the lower blades (not shown) being stationary, and attached to the bed-plate of the machine opposite the ends of the gage-plate *v*, and slightly in advance of the needles *e*. A coiled spring, *x*, has one end attached to the knife, and the other to the upright B, and operates by contractile action to keep the blade elevated. The needles *e* are not provided with eyes, but have a spiral groove, *f*, cut near the points *g*. This grove is reversed in its direction a short distance from the point, forming the shoulder

or hook *n*, over which the thread catches as the needles are withdrawn to form the stitch.

In the use of our improved machine the threads from the spools 1 1 1 are carried through the guides 3 3 3, thence upward through the tubes 11 and needle-openings 12, the loose ends being drawn out several inches upon the bed-piece U. The straw to be sewed is then placed in even layers crosswise upon the feed-belts in front of the gage *v*, which is elevated sufficiently to enable the desired quantity or thickness of straw to pass under the same without clogging or choking. Power is now applied to the handle H of the wheel G, causing the shaft 9 to partially rotate by means of the pawl 21, and the straw on the belts *r r* to be fed or carried forward a distance equal to the length of one stitch. The shaft 9, continuing to rotate until the lower ends of the pitmen F have passed the center of the same, the needles will be caused to descend and pass a short distance through the straw held between the bed U and gage *v*. The cam 19, now acting upon lever 5, through the pitman 29 and levers 18, 6, 8, and 7, moves the slide 16 and arms 10 laterally toward the upright B. The shaft 9 continuing to revolve, the end of the lever J passes from the cam I, and leaves the shaft K free to partially rotate; and the spring N, acting upon the slide M, moves it rapidly forward toward the drum P, until the carriers 11 have passed the needles, when the cam 19, being then out of contact with the lever 5, the spring 4 will force the lever upward, and reverse the movement of the slide 16, causing it to recede from the upright B until the carriers 11 have passed the needles. The lower end of the pitman F having now repassed the center of the shaft 9, the movement of the needles is reversed, being carried upward or withdrawn from the work. At nearly the same time the cam I is again brought into contact with the lever J, rotating the shaft K, and causing the arm L to act upon the stud *m* to move the slides M and 16 conjointly in the direction of the drum S.

From the foregoing it will be readily obvious to all conversant with such matters that the carriers 11 are caused to move in an irregular course entirely around the path of the needles, the needles descending in the crook of the bent arms 10, and while so descending the carriers moving first toward the upright B, then toward the drum P, then toward the upright B′, and lastly, while the needles are ascending, toward the drum S.

The stitch made by our improved machine is of the description known as the chain or or loop stitch, with the loops uppermost, and is formed in the following manner: The thread-carriers being in a position nearest the drum S, the needles commence their descent, the carriers at the same time moving in the irregular lateral course described. When the needles have attained their lowest position, the carriers move past the needles, between the same and the drum P, and in the direction of the upright B′, laying the threads in the grooves *f*, and holding them immediately over the hooks *n*. The needles then ascend, the threads being caught by the hooks and carried upward in the form of loops through the openings 12 and work on the bed U, until the points of the needles are above the gage *v*, where the loops are held until the work is fed along or caused to advance the length of a stitch by the belts *r r*. The needles then descend—the loops of thread being still around them—and take up new loops, which will be carried through the old loops and interlocked in a manner which will be apparent without a more explicit description.

The shears are operated by the bar C and springs *x*, the bar striking the blades *w* and forcing them down past the lower or fixed blades, and the springs raising them when the pressure of the bar is removed, thus trimming the edges of the work evenly as it advances through the machine.

Having thus explained my invention, what I claim is—

1. In a sewing-machine, substantially such as described, the slide M, provided with the spring N, and the slide 16, provided with the bent arms 10 and carriers 11, constructed and arranged to operate substantially as specified.

2. In a sewing-machine, substantially such as described, the rocker-shaft K, provided with the arms L J, the shaft 9, provided with the cams I 19, the slide M, carriers 11, slide 16, pitman 20, levers 5 6 7 18, spring 4, and needles *e*, combined and arranged to operate substantially as and for the purpose set forth and specified.

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